

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
 United States Patent and Trademark
 Office
 Box PCT
 Washington, D.C.20231
 ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 02 August 2000 (02.08.00)	
International application No. PCT/NO99/00356	Applicant's or agent's file reference 136312/ØS/BF
International filing date (day/month/year) 29 November 1999 (29.11.99)	Priority date (day/month/year) 01 December 1998 (01.12.98)
Applicant DYBEDOKKEN, Bjørn, Magne et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
 29 June 2000 (29.06.00)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Claudio Borton Telephone No.: (41-22) 338.83.38
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PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

To: OSLO PATENTKONTOR AS P.O. Box 7007 M N-0306 OSLO NORVEGE	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">N^o.</td> <td style="width: 50%;">O.Nr.</td> </tr> <tr> <td style="text-align: center; font-size: 1.5em;">75</td> <td></td> </tr> <tr> <td colspan="2" style="text-align: center;">Mottatt</td> </tr> <tr> <td colspan="2" style="text-align: center;">09 OCT. 2000</td> </tr> <tr> <td colspan="2">Går til:</td> </tr> <tr> <td colspan="2" style="text-align: center; font-size: 1.5em;">S</td> </tr> </table>	N ^o .	O.Nr.	75		Mottatt		09 OCT. 2000		Går til:		S	
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NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
EXAMINATION REPORT
(PCT Rule 71.1)

Applicant's or agent's file reference 136312/OS/BF		IMPORTANT NOTIFICATION	
International application No. PCT/NO99/00356	International filing date (day/month/year) 29/11/1999	Priority date (day/month/year) 01/12/1998	
Applicant TELEFONAKTIEBOLAGET LM ERICSSON et al.			

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/ <div style="display: flex; align-items: center;"> <div> European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465 </div> </div>	Authorized officer Scaglia, F Tel. +49 89 2399-2836
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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 136312/OS/BF	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/NO99/00356	International filing date (day/month/year) 29/11/1999	Priority date (day/month/year) 01/12/1998
International Patent Classification (IPC) or national classification and IPC H04L12/00		
Applicant TELEFONAKTIEBOLAGET LM ERICSSON et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 5 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 12 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 29/06/2000	Date of completion of this report 05.10.2000
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Hodgins, W Telephone No. +49 89 2399 8987 

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/NO99/00356

I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

Description, pages:

1-10 with telefax of 19/09/2000

Claims, No.:

1-8 with telefax of 19/09/2000

Drawings, sheets:

1/1 as originally filed

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/NO99/00356

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-8
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-8
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-8
	No:	Claims	

2. Citations and explanations

see separate sheet

Concerning Point V

- 1) D1: WO 98 28937 A1 (TELEFONAKTIEBOLAGET LM ERICSSON) 2 July 1998
D2: US 5 077 790 A (D'AMICO ET AL) 31 December 1991
D3: US 5 572 574 A (BARNES ET AL) 5 November 1996
- 2) Claim 1 relates to an arrangement in large DECT systems (or similar), including several Fixed Parts (FP) connected to the same Local Network (LNW), each of said FP associated with one or more Radio Fixed Parts (RFP). Such systems are or course generally known in the art, for example from D1, the closest prior art which is now cited in the description.

A list of acronyms common in the field of DECT is found on page 9 of the description.

A problem in such systems is that the handling of parameters such as PARI, RPN etc in a network with many FPs is complex and time consuming, especially when adding or removing FPs to the LNW. The current application aims to simplify this.

This is overcome in the current application (cf characterizing part of claim 1) by assigning a unique SARI to the first FP connected to the LNW. Means in the LNW then derives the PARIs of each FP from said SARI. Moreover, means are provided within each FP to manage the ids of associated RFPs so that each RFP has an RPN unique to its associated FP.

Although in D1, the allocation of the PARIs is (like in the current application) managed centrally in the LNW, deriving them from an initially allocated SARI is neither known nor derivable from the prior art. Moreover, in D1 the RPNs are also administrated centrally in the LNW, rather than in the associated FP.

Accordingly, since the claimed subject matter is neither known nor derivable from the prior art claim 1 meets the requirements of Articles 33(1) - (4) PCT with regard to novelty, inventive step and industrial applicability.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/NO99/00356

- 3) Owing to their dependence on claim 1, claims 2 - 8 also meet the requirements of Articles 33(1) - (4) PCT with regard to novelty, inventive step and industrial applicability.

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NO 009900356

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ARRANGEMENT IN A NETWORK, ESPECIALLY FOR LARGE DIGITAL
ENHANCED CORDLESS TELECOMMUNICATIONS (DECT) SYSTEMS

Field of the invention

The present invention relates to an arrangement in a
5 network, especially for large Digital Enhanced Cordless
Telecommunications (DECT) Systems, i.e. systems with
several fixed parts connected to the same local network.

Technical background

The problem area

10 In Figure 1 there is illustrated a DECT system with several
Fixed Parts (FP) connected to the same local network (LNW).
An FP contains all the elements in a DECT network between
the local network (LNW) and the DECT air interface.

Each FP has an ID that is unique within the network, the
15 Primary Access Rights Identity, PARI.

Each Radio Fixed Part (RFP, base station) has a Radio Fixed
Part Number, RPN that is unique within the fixed part that
it is connected to. The base stations transmit a Radio
Fixed Part Identity, RFPI, on the air interface. The RFPI
20 is a combination of the PARI, the RPN and an extension bit
E, and identifies the RFP and the FP that the RFP is
connected to. The RFPI is used by the *Portable Parts*, PPs
(handsets), to determine if they have access to the
network.

25 In addition to the RFPI, the RFP may transmit a *Secondary
Access Rights Identity*, SARI, which may also be used to
give the PPs access to the network.

The layout and rules for use of ARIs and RFPI is defined in (1).

The structure of ARI and RFPI for private networks, class B, is shown in Figure 2. The elements are defined as follows:

E **Extension bit.** Indicates if an SARI is available or not. Not relevant for this document.

ARC **Access Rights Class**
Shows the type of access to a DECT network, such as residential, private or public.

EIC **Equipment Installer's code**
This a code that is supplied by ETSI identifies the installer of the DECT system, e.g. Ericsson.

FPN **Fixed Part Number**
A 12-bit number that identifies the fixed part. The number is unique to each FP within a network.

RPN **Radio Fixed Part Number**
An 8-bit number that identifies the radio fixed part. The number is unique to each RFP within an FP.

20 The problem that this Invention Disclosure discusses is that of handling the different parameters such as PARI, RPN and FLI, in a network with many FP's. This applies both to the network owner, who must keep track of a number of parameters in his own network, and to the Equipment
25 Installer (e.g. Ericsson) who must keep a data base of parameters for all the fixed parts sold.

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- If an FP or an RFP is to be removed, or if an FP or an RFP is added to the network, the FP or RFP must be assigned a PARI or an RPN. There are also other parameters that must be adapted to handle the new or removed FP or RFP, such as
- 5 HLI. The Equipment Installer must find a free identity (ARI) for the customer (network owner), and the customer must then assign the value to the network.

This manual administration of parameters requires extensive bookkeeping and is therefore time consuming and costly.

10 Known solution

The use of DECT identities is described in detail in ETSI standards (1). ETSI does not, however, say anything about how the dealer of the system shall select and maintain the parameters.

15 Problems with known solutions

Administration of identities for DECT systems is time consuming and costly both for the manufacturer and the operator of the equipment. Anything that can reduce the complexity of operation is therefore desirable.

- 20 The problems with handling DECT identities can be separated in three areas:

- 1 Manufacturer: Assigning ARI values of the DECT equipment that is sold, and maintaining a database of these with reference to whom the equipment is sold.
- 25 This is especially complex if the equipment is sold via retailers.

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2 Network owner: More work to install new fixed parts, because the PARIs must be known and entered into the system manually. One cannot simply connect the hardware and start using it.

5 3 Security (Network owner): It is desirable to have as many of the (most significant) bits in the ARI for the different FPs in a network equal, to reduce the risk of illegal access. This decides the length of the HLI, and to maintain as high a security level as possible, the value of the HLI should be small. If FPs, with a different EIC than the existing FPs in the network, are added, the HLI will be large, and illegal access to the system will be easier.

Further prior art

15 From US 5,077,790 (D'Amico et al.) there is known a method for registration of a portable unit, that may be used in a communication system, comprising a network controller having a database for storing portable identification numbers. However, this prior art is silent about how to extend a telecommunication system having several fixed parts, in a safe and expedient manner.

US 5,572,574 relates to a method of on-air registration of a cordless telephone handset with a base station. Consequently, also this publication is silent about how to install new fixed parts in a network.

WO 98/28937 relates to an arrangement for location area management in a DECT system, in which a central unit connected to the fixed parts of a local area (LA) manages the identities within the LA. However, this solution may require manual entry of data identities for several times

after initialisation, e.g. when the handsets are to roam between systems.

Objects of the invention

5 An object of the present invention is to provide an arrangement whereby the problems related to known solutions are eliminated.

10 Another object of the present invention is to provide an arrangement whereby the dealer of the system can select and maintain the related parameters in a far more expedient manner.

Still another object of the present invention is to provide an arrangement whereby a network owner can install new fixed parts in a more time-saving and appropriate manner.

15 Yet another object of the present invention is to provide an arrangement whereby the network owner can maintain a high and secure level in order to reduce the risk of illegal access.

Summary of the invention

20 These objects are achieved in an arrangement as stated in the preamble, which according to the present invention is characterised by the features as stated in the characterising clause of the enclosed patent claim 1.

25 In other words, according to the present invention there is given a solution of automatically generating the needed identities.

Further features and advantages of the present invention will appear from the following description taken in conjunction with the enclosed drawings, as well as from the further enclosed patent claims.

5 Brief disclosure of the drawings

Figure 1 is a schematical diagram illustrating a DECT system with several fixed parts, in which system the present invention can find its application.

10 Figure 2 is a schematical diagram illustrating the layout of ARI and RFPI class B, private access.

Detailed description of embodiments

Reference is made to Figure 1, wherein is illustrated a Digital Enhanced Cordless Telecommunications System, DECT. This system comprises several fixed parts FP connected to
15 the same local network LNW. An FP contains all the elements in a DECT network between the local network LNW and the DECT air interface.

Each FP has an ID that is unique within the network, the Primary Access Rights Identity, PARI.

20 Consequently, each FP connected to a LNW must have its own, unique PARI within the network.

The local network will manage the PARI identities such that each FP has its own unique PARI. The FP will manage the identities of the base stations, such that each base
25 station has an RPN that is unique within the fixed part. The local network will automatically select a new ARI when

a new FP is connected. The FP will select a new base station identity when a new base station is connected.

When the first FP is connected to the network, the network must be given an SARI. The value of the SARI is given to the network operator by an Equipment installer (ref. EIC), and is entered into the network manually. The value of the SARI is unique to the network, and is distributed to all the FPs in the network, and is transmitted on all RFPs.

The PARI for each FP is calculated using the EIC-part of the SARI, see Figure 2. The HLI, which is common to the LNw, is recalculated and distributed to all FPs in the LNw when a new FP is added or removed.

The RPN for each RFP is handled by the individual FPs, and is automatically given to the RFPs when they are connected.

15 Advantages

The automatic generation of parameters will reduce service and maintenance cost both for the manufacturer/distributor and the operator of cordless telecommunication systems. This creates a concept of "plug-and-play".

20 Assigning similar PARI values to all FPs in a system ensures that the value of the HLI will be small. This reduces the risk that other users will attempt (illegal) access to the network.

Broadening

25 May be applicable to other cordless and cellular systems.

GLOSSARY AND ACRONYMS**Glossary****Fixed Part**

5

A physical grouping that contains all the elements in the DECT network between the local network and the DECT air interface.

Equipment Installer

10

The organisation that is responsible for installing the DECT equipment, usually the same as the manufacturer, e.g. Ericsson.

Local Network

15

A telecommunication network capable of offering local telecommunication services. In this document, the term "network" is used in the same meaning as "Local Network".

Portable Part

20

A physical grouping that contains all the elements between the user and the DECT air interface. Usually the cordless telephone handset.

Radio fixed part

25

A physical sub-group of an FP that contains all the radio endpoints that are connected to a single system of antennas (=radio base station)

Acronyms

	ARI	Access Rights Identity
	DECT	Digital Enhanced Cordless Telecommunications
	EIC	Equipment Installer's Code
5	FP	Fixed Part
	HLI	Handover Length Indicator
	LNW	Local Network
	PARI	Primary Access Rights Identity
	PARK	Portable Access Rights Key
10	PP	Portable Part
	RFP	Radio Fixed Part
	RPN	Radio fixed Part Number
	SARI	Secondary Access Rights Identity

Reference documents

1. ETS300175-6 Second Edition

Radio Equipment and systems (RES);

Digital Enhanced Cordless Telecommunications (DECT);

5 Common Interface (CI);

Part 6: Identities and addressing

19-09-2000

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11

P a t e n t c l a i m s

1. Arrangement in large Digital Enhanced Cordless Telecommunication (DECT) systems or similar systems, including several Fixed Parts (FP) connected to the same
5 Local Network (LNW), each of said FP associated with one or more Radio Fixed Parts (RFP),
c h a r a c t e r i z e d i n means for assigning a unique Secondary Access Rights Identity (SARI) to the LNW when the first FP is connected, means within the LNW for
10 automatically assigning a unique Primary Access Rights Identity (PARI) to each Fixed Part (FP) by deriving said PARI from a combination of an Equipment Installer's Code (EIC) included in said SARI and one or more generated bits, means within each Fixed Part (FP) for managing the
15 identities of associated Radio Fixed Parts/base stations (RFP) each to have a Radio Fixed Part Number (RPN) that is unique with the Fixed Part (FP).
2. Arrangement as claimed in claim 1,
20 c h a r a c t e r i z e d i n means within said LNW for selecting new Access Rights Identity (ARI) when a new fixed part (FP) is connected.
3. Arrangement as claimed in claim 1 or 2,
25 c h a r a c t e r i z e d i n means within the FP for selecting a new base station/Radio Fixed Part Identity when a new base station/Radio Fixed Part is connected.
4. Arrangement as claimed in any of the preceding claims,
30 c h a r a c t e r i z e d i n that said SARI is provided to the network operator by an Equipment Installer, and that said Equipment Installer or network operator manually enters said SARI into the network.

12

5. Arrangement as claimed in any of the preceding claims, characterized in means for distributing said SARI to all the FPs in the network and for transmitting to all RFPs.

5

6. Arrangement as claimed in any of the preceding claims, characterized in means for recalculating and distributing the Handover Length Indicator (HLI) to all FPs in the LNW when a new FP is added or removed.

10

7. Arrangement as claimed in any of the preceding claims, characterized in that the RPN for each RFP is handled by the individual FPs, and is automatically given to the RFPs when they are connected.

15

8. Arrangement as claimed in any of the preceding claims, characterized in that the arrangement is implemented as a "plug-and-play" concept.

ARRANGEMENT IN A NETWORK, ESPECIALLY FOR LARGE DIGITAL
ENHANCED CORDLESS TELECOMMUNICATIONS (DECT) SYSTEMS.

Field of the invention

5

The present invention relates to an arrangement in a network, especially for large Digital Enhanced Cordless Telecommunications (DECT) Systems, i.e. systems with several fixed parts connected to the same local network.

10

Technical background

The problem area

In fig. 1 there is illustrated a DECT system with several
15 Fixed Parts (FP) connected to the same local network (LNW). An FP contains all the elements in a DECT network between the local network (LNW) and the DECT air interface.

20 Each FP has an ID that is unique within the network, the Primary Access Rights Identity, PARI.

Each Radio Fixed Part (RFP, base station) has a Radio Fixed Part Number, RPN that is unique within the fixed
25 part that it is connected to. The base stations transmit a Radio Fixed Part Identity, RFPI, on the air interface. The RFPI is a combination of the PARI, the RPN and an extension bit E, and identifies the RFP and the FP that the RFP is connected to. The RFPI is used by the Portable
30 Parts, PPs (handsets), to determine if they have access to the network.

In addition to the RFPI, the RFP may transmit a *Secondary Access Rights Identity*, SARI, which may also be used to give the PPs access to the network.

The layout and rules for use of ARIs and RFPI is defined
5 in (1).

The structure of ARI and RFPI for private networks, class B, is shown in Figure 2. The elements are defined as follows:

10

E **Extension bit.** Indicates if an SARI is available or not. Not relevant for this document.

ARC **Access Rights Class**

Shows the type of access to a DECT network, such as
15 residential, private or public.

EIC **Equipment Installer's code**

This a code that is supplied by ETSI identifies the installer of the DECT system, e.g. Ericcson.

FPN **Fixed Part Number**

20 A 12-bit number that identifies the fixed part. The number is unique to each FP within a network.

RPN **Radio Fixed Part Number**

An 8-bit number that identifies the radio fixed part. The number is unique to each RFP within an FP.

25

The problem that this Invention Disclosure discusses is that of handling the different parameters such as PARI, RPN and HLI, in a network with many FPs. This applies both to the network owner, who must keep track of a
30 number of parameters in his own network, and to the Equipment Installer (e.g. Ericsson) who must keep a data base of parameters for all the fixed parts sold.

If an FP or RFP is to be removed, or if an FP or RFP is added to the network, the FP or RFP must be assigned a PARI or an RPN. There are also other parameters that must be adapted to handle the new or removed FP or RFP, such as HLI. The Equipment Installer must find a free identity (ARI) for the customer (network owner), and the customer must then assign the value to the network.

This manual administration of parameters requires extensive bookkeeping and is therefore time consuming and costly.

Known solution

The use of DECT identities is described in detail in ETSI standards (1). ETSI does not, however, say anything about how the dealer of the system shall select and maintain the parameters.

Problems with known solutions

Administration of identities for DECT systems is time consuming and costly both for the manufacturer and the operator of the equipment. Anything that can reduce the complexity of operation is therefore desirable.

The problems with handling DECT identities can be separated in three areas:

- 1 Manufacturer: Assigning ARI values of the DECT equipment that is sold, and maintaining a database of these with reference to whom the equipment is sold. This is especially complex if the equipment is sold via retailers.

2 **Network owner:** More work to install new fixed parts,
because the PARIs must be known and entered into the
system manually. One cannot simply connect the
5 hardware and start using it.

3 **Security (Network owner):** It is desirable to have as
many of the (most significant) bits in the ARI for
the different FPs in a network equal, to reduce the
10 risk of illegal access. This decides the length of
the HLI, and to maintain as high a security level as
possible, the value of the HLI should be small. If
FPs, with a different EIC than the existing FPs in
the network, are added, the HLI will be large, and
15 illegal access to the system will be easier.

Further prior art

From US 5,077,790 (D'Amico et al.) there is known a
20 method for registration of a portable unit, that may be
used in a communication system, comprising a network
controller having a database for storing portable
identification numbers. However, this prior art is silent
about how to extend a telecommunication system having
25 several fixed parts, in a safe and expedient manner.

US 5,572,574 relates to a method of on-air registration
of a cordless telephone handset with a base station.
Consequently, also this publication is silent about how
30 to install new fixed parts in a network.

Objects of the invention

5 An object of the present invention is to provide an arrangement whereby the problems related to known solutions are eliminated.

10 Another object of the present invention is to provide an arrangement whereby the dealer of the system can select and maintain the related parameters in a far more expedient manner.

15 Still another object of the present invention is to provide an arrangement whereby a network owner can install new fixed parts in a more time-saving and appropriate manner.

20 Yet another object of the present invention is to provide an arrangement whereby the network owner can maintain a high and secure level in order to reduce the risk of illegal access.

Summary of the invention

25 These objects are achieved in an arrangement as stated in the preamble, which according to the present invention is characterised by the features as stated in the characterising clause of the enclosed patent claim 1.

30 In other words, according to the present invention there is given a solution of automatically generating the needed identities.

Further features and advantages of the present invention will appear from the following description taken in conjunction with the enclosed drawings, as well as from the further enclosed patent claims.

5

Brief disclosure of the drawings

Fig. 1 is a schematical diagram illustrating a DECT system with several fixed parts, in which system the present invention can find its application.

Fig. 2 is a schematical diagram illustrating the layout of ARI and RFPI class B, private access.

15 Detailed description of embodiments

Reference is made to Fig. 1, wherein is illustrated a Digital Enhanced Cordless Telecommunications System, DECT. This system comprises several fixed parts FP connected to the same local network LNW. An FP contains all the elements in a DECT network between the local network LNW and the DECT air interface.

Each FP has an ID that is unique within the network, the Primary Access Rights Identity, PARI.

Consequently, each FP connected to a LNW must have its own, unique PARI within the network.

30 The local network will manage the PARI identities such that each FP has its own unique PARI. The FP will manage the identities of the base stations, such that each base station has an RPN that is unique within the fixed part.

The local network will automatically select a new ARI when a new FP is connected. The FP will select a new base station identity when a new base station is connected.

- 5 When the first FP is connected to the network, the network must be given an SARI. The value of the SARI is given to the network operator by an Equipment installer (ref. EIC), and is entered into the network manually. The value of the SARI is unique to the network, and is
- 10 distributed to all the FPs in the network. and is transmitted on all RFPs.

The PARI for each FP is calculated using the EIC-part of the SARI, see Figure 2. The HLI, which is common to the

15 LNW, is recalculated and distributed to all FPs in the LNW when a new FP is added or removed.

The RPN for each RFP is handled by the individual FPs, and is automatically given to the RFPs when they are

20 connected.

Advantages

The automatic generation of parameters will reduce

25 service and maintenance cost both for the manufacturer/distributor and the operator of cordless telecommunication systems. This creates a concept of "plug-and-play".

30 Assigning similar PARI values to all FPs in a system ensures that the value of the HLI will be small. This reduces the risk that other users will attempt (illegal) access to the network:

Broadening

May be applicable to other cordless and cellular systems.

5

Glossary and Acronyms**Glossary****Fixed Part**

10

A physical grouping that contains all the elements in the DECT network between the local network and the DECT air interface.

15 **Equipment Installer**

The organisation that is responsible for installing the DECT equipment, usually the same as the manufacturer, e.g. Ericsson.

20 **Local Network**

A telecommunication network capable of offering local telecommunication services. In this document, the term "network" is used in the same meaning as "Local Network".

25

Portable Part

A physical grouping that contains all the elements between the user and the DECT air interface. Usually the cordless telephone handset.

30

Radio fixed part

A physical sub-group of an FP that contains all the radio endpoints that are connected to

a single system of antennas
(=radio base station)

Acronyms

	ARI	Access Rights Identity
5	DECT	Digital Enhanced Cordless Telecommunications
	EIC	Equipment Installer's Code
	FP	Fixed Part
	HLI	Handover Length Indicator
	LNW	Local Network
10	PARI	Primary Access Rights Identity
	PARK	Portable Access Rights Key
	PP	Portable Part
	RFP	Radio Fixed Part
	RPN	Radio fixed Part Number
15	SARI	Secondary Access Rights Identity

Reference documents

- (1) ETS300175-6 Second Edition
- 20 Radio Equipment and systems (RES);
Digital Enhanced Cordless Telecommunications (DECT);
Common Interface (CI);
Part 6: Identities and addressing

C l a i m s

1. Arrangement in a network, especially for large Digital Enhanced Cordless Telecommunications (DECT) systems, i.e. systems with several fixed parts (FP) connected to the same local network (LNW),
c a r a c h e r i s e d i n that each fixed part (FP) is given its own unique Primary Access Rights Identity (PARI), said PARI identities being managed by the local network LNW, and that each fixed part (FP) will manage the identities of associated Radio Fixed Parts/base stations (RFP) such that each base station will be given a Radio Fixed Part Number (RPN) that is unique with the Fixed Part (FP).
2. Arrangement as claimed in claim 1,
c a r a c h e r i s e d i n that said local network (LNW) is further provided with means for selecting new Access Rights Identity (ARI) when a new fixed part (FP) is connected.
3. Arrangement as claimed in claim 1 or 2,
c a r a c h e r i s e d i n that said fixed part (FP) comprises means for selecting a new base station/Radio Fixed Part Identity when a new base station/Radio Fixed Part is connected.
4. Arrangement as claimed in any of the preceding claims,
c a r a c h e r i s e d i n that said network is given a Secondary Access Rights Identity (SARI), especially when a first fixed part (FP) is connected to the network.

5. Arrangement as claimed in claim 4, characterised in that said SARI is given to the network operator by an Equipment installer and is entered into the network manually.

5

6. Method as claimed in claim 4 or 5, characterised in that said SARI, being unique to the network, is distributed to all the FPs in the network and is transmitted to all RFPs.

10

7. Arrangement as claimed in any of the preceding claims, characterised in that said PARI of each FP is calculated by using the EIC-part of the SARI.

15

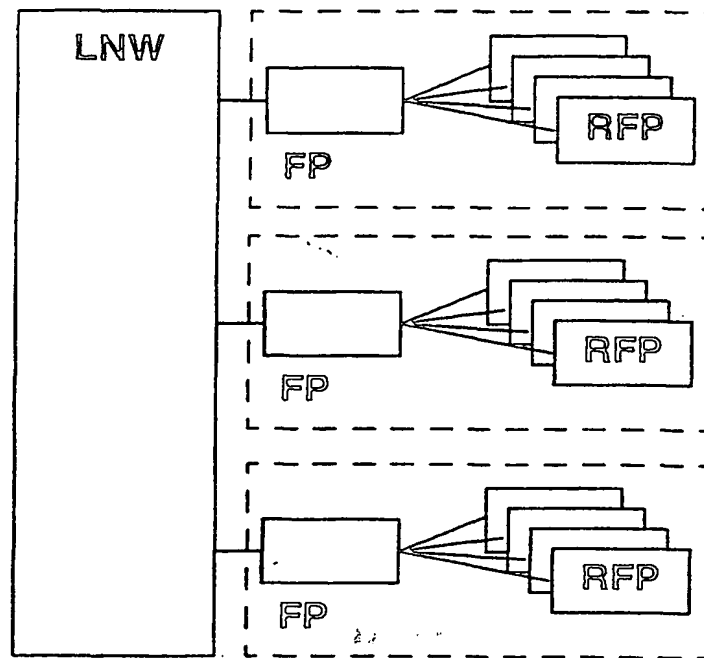
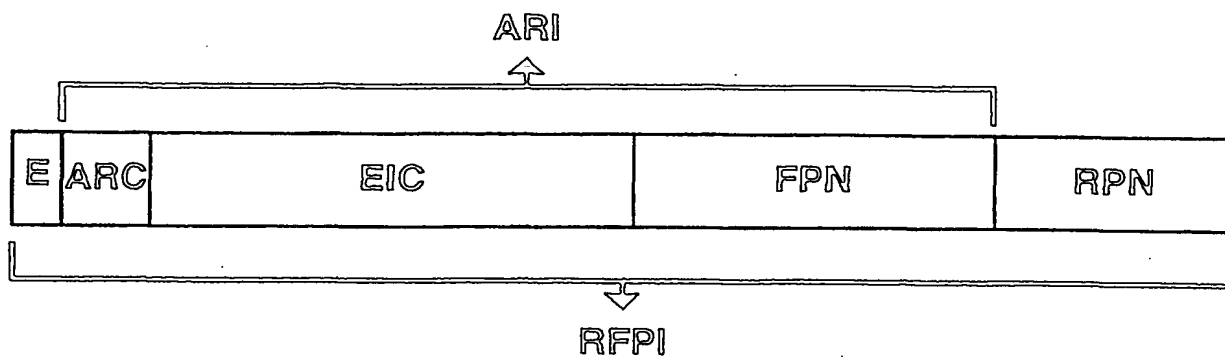
8. Arrangement as claimed in any of the preceding claims, characterised in that the Handover Length Indicator (HLI), which is common to the LNW, is recalculated and distributed to all FPs in the LNW when a new FP is added or removed.

20

9. Arrangement as claimed in any of the preceding claims, characterised in that the RPN for each RFP is handled by the individual FPs, and is automatically given to RFPs when they are connected.

25

10. Arrangement as claimed in any of the preceding claims, characterised in that the arrangement is implemented as a "plug-and-play" concept.

Figure 1Figure 2

PCT

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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁷ : H04L 12/00	A2	(11) International Publication Number: WO 00/33507 (43) International Publication Date: 8 June 2000 (08.06.00)
(21) International Application Number: PCT/NO99/00356 (22) International Filing Date: 29 November 1999 (29.11.99) (30) Priority Data: 19985608 1 December 1998 (01.12.98) NO (71) Applicant (for all designated States except US): TELEFONAKTIEBOLAGET LM ERICSSON [SE/SE]; S-126 25 Stockholm (SE). (72) Inventors; and (75) Inventors/Applicants (for US only): DYBEDOKKEN, Bjørn, Magne [NO/NO]; Nedre Toppenhaug 86, N-1353 Bærums Verk (NO). TØNNESLAND, Sverre [NO/NO]; Etterstad-sletta 76, N-0659 Oslo (NO). (74) Agent: OSLO PATENTKONTOR AS; Postboks 7007 M, N-0306 Oslo (NO).		(81) Designated States: AE, AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), DM, EE, EE (Utility model), ES, FI, FI (Utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KR (Utility model), KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>Without international search report and to be republished upon receipt of that report.</i>
(54) Title: ARRANGEMENT IN A NETWORK, ESPECIALLY FOR LARGE DIGITAL ENHANCED CORDLESS TELECOMMUNICATIONS (DECT) SYSTEMS (57) Abstract The present invention relates to an arrangement in a network, especially for large Digital Enhanced Cordless Telecommunications (DECT) Systems, i.e. systems with several fixed parts (FP) connected to the same local network (LNW), and for the purpose of providing a system that can select and maintain the parameters of such a system in a more efficient and expedient manner, it is according to the invention suggested that each fixed part (FP) is given its own unique Primary Access Rights Identity (PARI), said PARI identities being managed by the local network LNW, and that each fixed part (FP) will manage the identities of associated Radio Fixed Parts/base stations (RFP) such that each base station will be given a Radio Fixed Part Number (RPN) that is unique with the Fixed Part (FP).		

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ARRANGEMENT IN A NETWORK, ESPECIALLY FOR LARGE DIGITAL
ENHANCED CORDLESS TELECOMMUNICATIONS (DECT) SYSTEMS.

Field of the invention

5

The present invention relates to an arrangement in a network, especially for large Digital Enhanced Cordless Telecommunications (DECT) Systems, i.e. systems with several fixed parts connected to the same local network.

10

Technical background

The problem area

In fig. 1 there is illustrated a DECT system with several
15 Fixed Parts (FP) connected to the same local network (LNW). An FP contains all the elements in a DECT network between the local network (LNW) and the DECT air interface.

20 Each FP has an ID that is unique within the network, the Primary Access Rights Identity, PARI.

Each Radio Fixed Part (RFP, base station) has a Radio Fixed Part Number, RPN that is unique within the fixed
25 part that it is connected to. The base stations transmit a Radio Fixed Part Identity, RFPI, on the air interface. The RFPI is a combination of the PARI, the RPN and an extension bit E, and identifies the RFP and the FP that the RFP is connected to. The RFPI is used by the Portable
30 Parts, PPs (handsets), to determine if they have access to the network.

In addition to the RFPI, the RFP may transmit a *Secondary Access Rights Identity*, SARI, which may also be used to give the PPs access to the network.

The layout and rules for use of ARIs and RFPI is defined
5 in (1).

The structure of ARI and RFPI for private networks, class B, is shown in Figure 2. The elements are defined as follows:

10

E **Extension bit.** Indicates if an SARI is available or not. Not relevant for this document.

ARC **Access Rights Class**

Shows the type of access to a DECT network, such as
15 residential, private or public.

EIC **Equipment Installer's code**

This a code that is supplied by ETSI identifies the installer of the DECT system, e.g. Ericcson.

FPN **Fixed Part Number**

A 12-bit number that identifies the fixed part. The
20 number is unique to each FP within a network.

RPN **Radio Fixed Part Number**

An 8-bit number that identifies the radio fixed
part. The number is unique to each RFP within an FP.

25

The problem that this Invention Disclosure discusses is that of handling the different parameters such as PARI, RPN and HLI, in a network with many FPs. This applies both to the network owner, who must keep track of a
30 number of parameters in his own network, and to the Equipment Installer (e.g. Ericsson) who must keep a data base of parameters for all the fixed parts sold.

If an FP or RFP is to be removed, or if an FP or RFP is added to the network, the FP or RFP must be assigned a PARI or an RPN. There are also other parameters that must be adapted to handle the new or removed FP or RFP, such as HLI. The Equipment Installer must find a free identity (ARI) for the customer (network owner), and the customer must then assign the value to the network.

This manual administration of parameters requires extensive bookkeeping and is therefore time consuming and costly.

Known solution

The use of DECT identities is described in detail in ETSI standards (1). ETSI does not, however, say anything about how the dealer of the system shall select and maintain the parameters.

Problems with known solutions

Administration of identities for DECT systems is time consuming and costly both for the manufacturer and the operator of the equipment. Anything that can reduce the complexity of operation is therefore desirable.

The problems with handling DECT identities can be separated in three areas:

- 1 **Manufacturer:** Assigning ARI values of the DECT equipment that is sold, and maintaining a database of these with reference to whom the equipment is sold. This is especially complex if the equipment is sold via retailers.

- 2 **Network owner:** More work to install new fixed parts,
because the PARIs must be known and entered into the
system manually. One cannot simply connect the
5 hardware and start using it.
- 3 **Security (Network owner):** It is desirable to have as
many of the (most significant) bits in the ARI for
the different FPs in a network equal, to reduce the
10 risk of illegal access. This decides the length of
the HLI, and to maintain as high a security level as
possible, the value of the HLI should be small. If
FPs, with a different EIC than the existing FPs in
the network, are added, the HLI will be large, and
15 illegal access to the system will be easier.

Further prior art

From US 5,077,790 (D'Amico et al.) there is known a
20 method for registration of a portable unit, that may be
used in a communication system, comprising a network
controller having a database for storing portable
identification numbers. However, this prior art is silent
about how to extend a telecommunication system having
25 several fixed parts, in a safe and expedient manner.

US 5,572,574 relates to a method of on-air registration
of a cordless telephone handset with a base station.
Consequently, also this publication is silent about how
30 to install new fixed parts in a network.

Objects of the invention

5 An object of the present invention is to provide an arrangement whereby the problems related to known solutions are eliminated.

10 Another object of the present invention is to provide an arrangement whereby the dealer of the system can select and maintain the related parameters in a far more expedient manner.

15 Still another object of the present invention is to provide an arrangement whereby a network owner can install new fixed parts in a more time-saving and appropriate manner.

20 Yet another object of the present invention is to provide an arrangement whereby the network owner can maintain a high and secure level in order to reduce the risk of illegal access.

Summary of the invention

25 These objects are achieved in an arrangement as stated in the preamble, which according to the present invention is characterised by the features as stated in the characterising clause of the enclosed patent claim 1.

30 In other words, according to the present invention there is given a solution of automatically generating the needed identities.

Further features and advantages of the present invention will appear from the following description taken in conjunction with the enclosed drawings, as well as from the further enclosed patent claims.

5

Brief disclosure of the drawings

Fig. 1 is a schematical diagram illustrating a DECT system with several fixed parts, in which system the present invention can find its application.

10

Fig. 2 is a schematical diagram illustrating the layout of ARI and RFPI class B, private access.

15 Detailed description of embodiments

Reference is made to Fig. 1, wherein is illustrated a Digital Enhanced Cordless Telecommunications System, DECT. This system comprises several fixed parts FP connected to the same local network LNW. An FP contains all the elements in a DECT network between the local network LNW and the DECT air interface.

20

Each FP has an ID that is unique within the network, the Primary Access Rights Identity, PARI.

25

Consequently, each FP connected to a LNW must have its own, unique PARI within the network.

The local network will manage the PARI identities such that each FP has its own unique PARI. The FP will manage the identities of the base stations, such that each base station has an RPN that is unique within the fixed part.

30

The local network will automatically select a new ARI when a new FP is connected. The FP will select a new base station identity when a new base station is connected.

- 5 When the first FP is connected to the network, the network must be given an SARI. The value of the SARI is given to the network operator by an Equipment installer (ref. EIC), and is entered into the network manually. The value of the SARI is unique to the network, and is
10 distributed to all the FPs in the network, and is transmitted on all RFPs.

The PARI for each FP is calculated using the EIC-part of the SARI, see Figure 2. The HLI, which is common to the
15 LNW, is recalculated and distributed to all FPs in the LNW when a new FP is added or removed.

The RPN for each RFP is handled by the individual FPs, and is automatically given to the RFPs when they are
20 connected.

Advantages

The automatic generation of parameters will reduce
25 service and maintenance cost both for the manufacturer/distributor and the operator of cordless telecommunication systems. This creates a concept of "plug-and-play".

- 30 Assigning similar PARI values to all FPs in a system ensures that the value of the HLI will be small. This reduces the risk that other users will attempt (illegal) access to the network.

Broadening

May be applicable to other cordless and cellular systems.

5

Glossary and Acronyms**Glossary****Fixed Part**

10

A physical grouping that contains all the elements in the DECT network between the local network and the DECT air interface.

15 **Equipment Installer**

The organisation that is responsible for installing the DECT equipment, usually the same as the manufacturer, e.g. Ericsson.

20 **Local Network**

A telecommunication network capable of offering local telecommunication services. In this document, the term "network" is used in the same meaning as "Local Network".

25

Portable Part

A physical grouping that contains all the elements between the user and the DECT air interface. Usually the cordless telephone handset.

30

Radio fixed part

A physical sub-group of an FP that contains all the radio endpoints that are connected to

a single system of antennas
(=radio base station)

Acronyms

	ARI	Access Rights Identity
5	DECT	Digital Enhanced Cordless Telecommunications
	EIC	Equipment Installer's Code
	FP	Fixed Part
	HLI	Handover Length Indicator
	LNW	Local Network
10	PARI	Primary Access Rights Identity
	PARK	Portable Access Rights Key
	PP	Portable Part
	RFP	Radio Fixed Part
	RPN	Radio fixed Part Number
15	SARI	Secondary Access Rights Identity

Reference documents

- (1) **ETS300175-6 Second Edition**
- 20 Radio Equipment and systems (RES);
 Digital Enhanced Cordless Telecommunications (DECT);
 Common Interface (CI);
 Part 6: Identities and addressing

C l a i m s

1. Arrangement in a network, especially for large Digital
Enhanced Cordless Telecommunications (DECT) systems, i.e.
5 systems with several fixed parts (FP) connected to the
same local network (LNW),
c a r a c h e r i s e d i n that each fixed part (FP)
is given its own unique Primary Access Rights Identity
(PARI), said PARI identities being managed by the local
10 network LNW, and that each fixed part (FP) will manage
the identities of associated Radio Fixed Parts/base
stations (RFP) such that each base station will be given
a Radio Fixed Part Number (RPN) that is unique with the
Fixed Part (FP).
- 15
2. Arrangement as claimed in claim 1,
c a r a c h e r i s e d i n that said local network
(LNW) is further provided with means for selecting new
Access Rights Identity (ARI) when a new fixed part (FP)
20 is connected.
3. Arrangement as claimed in claim 1 or 2,
c a r a c h e r i s e d i n that said fixed part (FP)
comprises means for selecting a new base station/Radio
25 Fixed Part Identity when a new base station/Radio Fixed
Part is connected.
4. Arrangement as claimed in any of the preceding claims,
c a r a c h e r i s e d i n that said network is
30 given a Secondary Access Rights Identity (SARI),
especially when a first fixed part (FP) is connected to
the network.

5. Arrangement as claimed in claim 4,
c a r a c h e r i s e d i n that said SARI is given
to the network operator by an Equipment installer and is
entered into the network manually.

5

6. Method as claimed in claim 4 or 5,
c a r a c h e r i s e d i n that said SARI, being
unique to the network, is distributed to all the FPs in
the network and is transmitted to all RFPs.

10

7. Arrangement as claimed in any of the preceding claims,
c a r a c h e r i s e d i n that said PARI of each FP
is calculated by using the EIC-part of the SARI.

15

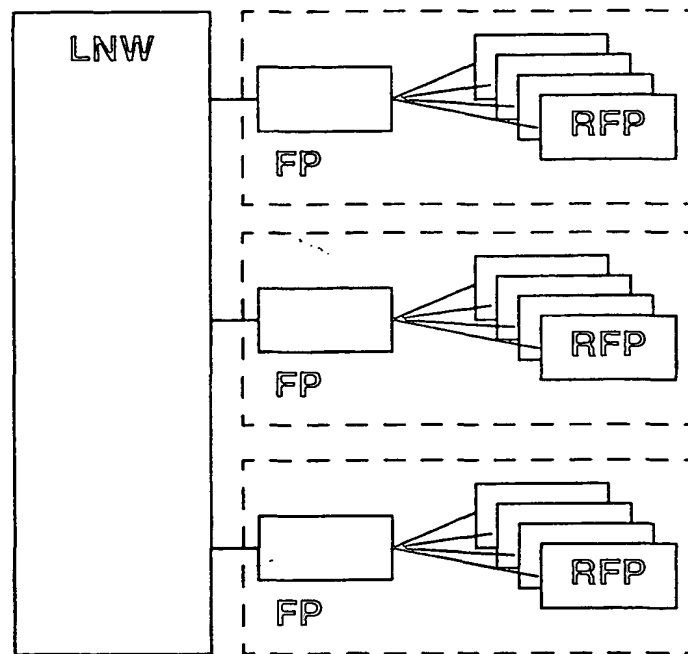
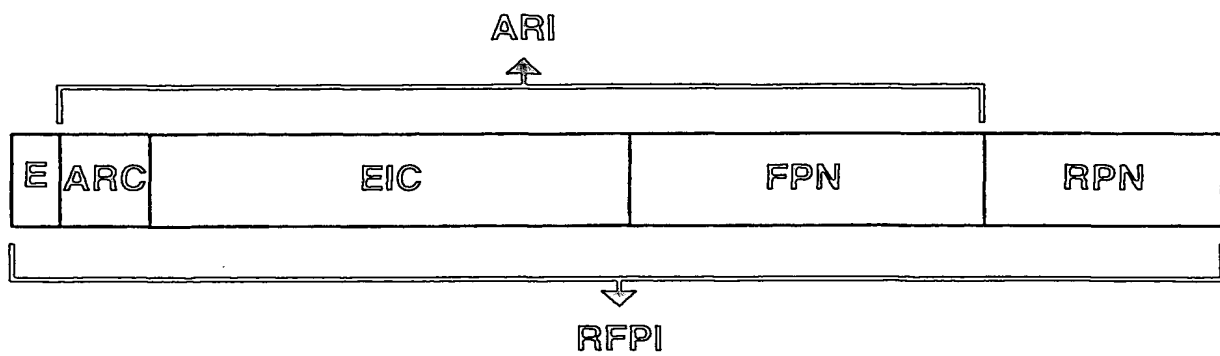
8. Arrangement as claimed in any of the preceding claims,
c a r a c h e r i s e d i n that the Handover Length
Indicator (HLI), which is common to the LNW, is
recalculated and distributed to all FPs in the LNW when a
new FP is added or removed.

20

9. Arrangement as claimed in any of the preceding claims,
c a r a c h e r i s e d i n that the RPN for each RFP
is handled by the individual FPs, and is automatically
given to RFPs when they are connected.

25

10. Arrangement as claimed in any of the preceding
claims,
c a r a c h e r i s e d i n that the arrangement is
implemented as a "plug-and-play" concept.

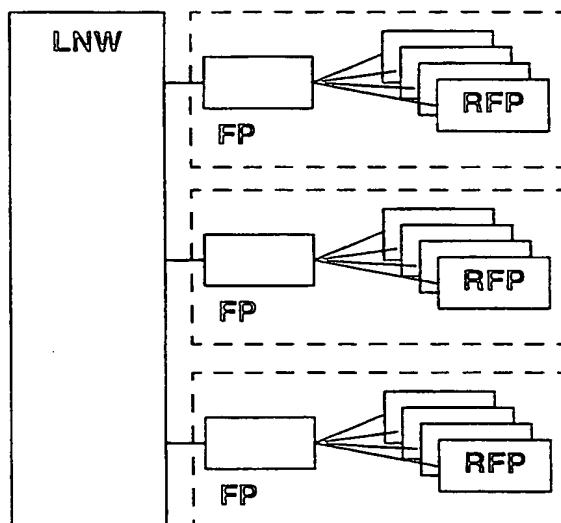
Figure 1Figure 2



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁷ : H04Q 7/38, 7/26	A3	(11) International Publication Number: WO 00/33507 (43) International Publication Date: 8 June 2000 (08.06.00)
(21) International Application Number: PCT/NO99/00356 (22) International Filing Date: 29 November 1999 (29.11.99) (30) Priority Data: 19985608 1 December 1998 (01.12.98) NO (71) Applicant (for all designated States except US): TELEFONAK- TIEBOLAGET LM ERICSSON [SE/SE]; S-126 25 Stock- holm (SE). (72) Inventors; and (75) Inventors/Applicants (for US only): DYBEDOKKEN, Bjørn, Magne [NO/NO]; Nedre Toppenhaug 86, N-1353 Bærum Verk (NO). TØNNESLAND, Sverre [NO/NO]; Etterstad- sletta 76, N-0659 Oslo (NO). (74) Agent: OSLO PATENTKONTOR AS; Postboks 7007 M, N-0306 Oslo (NO).		(81) Designated States: AE, AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), DM, EE, EE (Utility model), ES, FI, FI (Utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KR (Utility model), KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> (88) Date of publication of the international search report: 10 August 2000 (10.08.00)

(54) Title: ARRANGEMENT IN A NETWORK, ESPECIALLY FOR LARGE DIGITAL ENHANCED CORDLESS TELECOMMUNICATIONS (DECT) SYSTEMS

**(57) Abstract**

The present invention relates to an arrangement in a network, especially for large Digital Enhanced Cordless Telecommunications (DECT) Systems, i.e. systems with several fixed parts (FP) connected to the same local network (LNW), and for the purpose of providing a system that can select and maintain the parameters of such a system in a more efficient and expedient manner, it is according to the invention suggested that each fixed part (FP) is given its own unique Primary Access Rights Identity (PARI), said PARI identities being managed by the local network LNW, and that each fixed part (FP) will manage the identities of associated Radio Fixed Parts/base stations (RFP) such that each base station will be given a Radio Fixed Part Number (RPN) that is unique with the Fixed Part (FP).

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/NO 99/00356

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: H04Q 7/38, H04Q 7/26

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 9828937 A1 (TELEFONAKTIEBOLAGET LM ERICSSON), 2 July 1998 (02.07.98), page 5, line 9 - line 21	1
A	--	2-20
A	US 5077790 A (D'AMICO ET AL), 31 December 1991 (31.12.91)	1-20
A	US 5572574 A (BARNES ET AL), 5 November 1996 (05.11.96)	1-20

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search

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